

**PATENT COOPERATION TREATY**  
**PCT**  
**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**  
(Chapter II of the Patent Cooperation Treaty)  
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference KP:LMB:FP20760	<b>FOR FURTHER ACTION</b>	See Form PCT/IPEA/416
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Applicant SMART INTERNET TECHNOLOGY CRC PTY LTD et al		

This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

a. ☒ (sent to the applicant and to the International Bureau) a total of 26 sheets, as follows:

☒ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or table related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

<input checked="" type="checkbox"/>	Box No. I	Basis of the report
<input type="checkbox"/>	Box No. II	Priority
<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/>	Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/>	Box No. VI	Certain documents cited
<input type="checkbox"/>	Box No. VII	Certain defects in the international application
<input type="checkbox"/>	Box No. VIII	Certain observations on the international application

Date of submission of the demand 23 June 2005	Date of completion of the report 9 November 2005
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer  JUZER KHANBHAI Telephone No. (02) 6283 2176

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/AU2004/001673

## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language which is the language of a translation furnished for the purposes of:

☐ international search (under Rules 12.3 and 23.1 (b))

☐ publication of the international application (under Rule 12.4)

☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

☐ the international application as originally filed/furnished

☒ the description:

pages 1 as originally filed/furnished

pages\* received by this Authority on with the letter of

pages\* 2-21 received by this Authority on 30 June 2005 with the letter of 29 June 2005

☒ the claims:

pages as originally filed/furnished

pages\* as amended (together with any statement) under Article 19

pages\* received by this Authority on with the letter of

pages\* 22-27 received by this Authority on 30 June 2005 with the letter of 29 June 2005

☒ the drawings:

pages 1/4-4/4 as originally filed/furnished

pages\* received by this Authority on with the letter of

pages\* received by this Authority on with the letter of

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages

☐ the claims, Nos.

☐ the drawings, sheets/figs

☐ the sequence listing (*specify*):

☐ any table(s) related to the sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages

☐ the claims, Nos.

☐ the drawings, sheets/figs

☐ the sequence listing (*specify*):

☐ any table(s) related to the sequence listing (*specify*):

\* If item 4 applies, some or all of those sheets may be marked "superseded."

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/AU2004/001673

**Box No. V** Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims 1-42	YES
	Claims -	NO
Inventive step (IS)	Claims 1-42	YES
	Claims -	NO
Industrial applicability (IA)	Claims 1-42	YES
	Claims -	NO

## 2. Citations and explanations (Rule 70.7)

Claims 1-42: The invention defined by the amended claims relate to a communication system and method including a determining means to determine an attribute of a communicating device, an identifying means to identify an avatar by using the attribute and a communicating means operable to communicated the avatar to the communication device in a virtual environment.

No individual citation or obvious combination of citations discloses communicating an avatar in a virtual environment. Hence, the claimed invention is novel and inventive.

rather cumbersome task of organising or arranging a time to communicate with the group and establishing a conference call between the members of the group.

5 SUMMARY OF THE INVENTION

According to a first aspect of the present invention there is provided a communication system. A particular embodiment of the communication system comprises:

10 determining means operable to determine an attribute of a communication device;

identifying means operable to identify an avatar by using the attribute, wherein the avatar is such that it conveys to a viewer thereof information about a person; and

15 communicating means operable to communicate the avatar to the communication device in a virtual environment.

By communicating the avatar to the communication device a user (the viewer) thereof is able to obtain information about the person without the user and the person communicating directly with each other. More specifically, if the person was at work and wanted to convey this information to the viewer then the avatar  
25 could, for example, depict the person in a business suit carrying a briefcase.

Conveying the avatar in the virtual environment is advantageous because it allows further information to be  
30 conveyed to the viewer. For example, if the person is at work then the virtual environment may represent a virtual office, which includes images of, for example, a desk and chairs. Furthermore, depicting the avatar in the virtual environment has the ability to make the system more  
35 appealing to users of the system.

The word "avatar" as used throughout this

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specification is a reference to a form of image (such as a digital photograph or animated icon), which when viewed conveys some information about an activity that the person is involved in.

5

The particular embodiment of the communication system further comprises replacing means operable to replace the avatar with another avatar.

10

The replacing means enables different information about the person to be conveyed to the viewer. For instance, an initial avatar may indicate that the person is at work, whilst a replacement avatar may indicate that the person is out shopping. The replacement avatar that represents the person out shopping could, for example, be an image of the person carrying shopping bags. An advantage of being able to replace the avatar is that it effectively allows the person to inform the viewer of changes in activities that the person is involved in.

15

Persons skilled in the art will readily appreciate that replacing the avatar also comprises changing a visual aspect of the avatar.

20

In the particular embodiment of the communication system the identifying means is operable to identify the avatar by comparing the attribute to a communication device identifier that is associated with the avatar.

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Comparing the attribute to the communication device identifier effectively enables the avatar to be selected based on, for example, a telephone number of the communication device.

30

The particular embodiment of the communication system further comprises recording means arranged to allow the person to record the communication device identifier.

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Thus, the recording means effectively provides a mechanism for allowing the person to control who will receive the avatar. For example, the avatar may only be sent to the communication device if the attribute matches the communication device identifier recorded by the recording means. In the event that the attribute does not match the communication device identifier, then the avatar will not be sent to the communication device.

10 In the particular embodiment of the communication system the replacing means is further operable to replace the communication device identifier with another communication device identifier.

15 Being able to replace the communication device identifier enables a change in respect of allowing another communication device to receive the avatar.

The particular embodiment of the communication system further comprises selecting means operable to allow the person to select the avatar from a plurality of other avatars.

25 Being able to select the avatar from a plurality of other avatars is advantageous because it enables an appropriate avatar to be selected to represent the activity that the person is engaged in. Each of the avatars could depict different activities that the person could undertake.

30 In the particular embodiment of the communication system the selecting means is further operable to allow the communication device identifier to be selected from a plurality of other communication device identifiers.

35 In the particular embodiment of the communication system the determining means is operable to determine the

- 5 -

attribute by processing caller identification data associated with the communication device.

5 In the particular embodiment of the communication system the system further comprises messaging means operable to create a text, an audio and/or a video message that is associated with the avatar.

10 Conveying the text, the audio and/or the video message provides yet another mechanism for conveying further information to the user of the communication device.

15 In the particular embodiment of the communication system the avatar and the plurality of other avatars depict an activity that involves the person.

20 In the particular embodiment of the communication system the communication device comprises a mobile telephone and the attribute comprises a telephone number of the mobile telephone.

25 According to a second aspect of the present invention there is provided a communication system. A particular embodiment of the communication system comprises:

an environment support means operable to support at least one virtual environment that can be accessed by a first person; and

30 a communicating means operable to communicate an avatar in the virtual environment to the first person subsequent to the first person accessing the environment, the avatar being such that it can convey to the first person information about a second person.

35 The ability to communicate the avatar in the virtual environment has the advantage of facilitating the formation of spontaneous, multiple, virtual social and/or business

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networks. Thus, improving the attractiveness of the system to users.

5 In the particular embodiment of the communication system the environment support means is operable to determine a level of authority associated with the second person, and provide the second person with access to the virtual environment if the level of authority is deemed appropriate.

10

The ability to provide access to the virtual environment based on the level of authority has the advantage of facilitating control over who can access the virtual environment.

15

In the particular embodiment of the communication system the environment support means is operable to allow the first person to assign the level of authority.

20

In the particular embodiment of the communication system the environment support means is such that it allows the first person to arrange the virtual environment such that it has a desired appearance.

25

Being able to arrange the virtual environment is particularly useful in a situation where the virtual environment models, for example, a virtual office. Arranging the virtual office can include, for instance, placing a desk and picture in a required location. The effect of this is that the virtual environment take on an appearance that suits the first person.

30

In the particular embodiment of the communication system the environment support means is operable to allow the first person and the second person to exchange other information via the virtual environment.

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In the particular embodiment of the communication system the other information comprises multi-media content.

5 In the particular embodiment of the communication system the communicating means is further operable to allow the second person to control whether the avatar conveys the information to the first person.

10 Controlling whether the avatar conveys the information to the first person ensures that the first person only receives information that the second person wants the first person to receive.

15 In the particular embodiment of the communication system the environment support means is operable to allow the first person to access the virtual environment via a communication network, the communicating means also being operable to communicate the avatar in the virtual environment to the first person via the communication  
20 network.

Thus, providing the advantage of allowing the first person to access the environment from a remote location, and receive the avatar in the virtual environment at the  
25 remote location.

In the particular embodiment of the communication system the information conveyed by the avatar to the first person comprises audio and/or video information.  
30

According to a third aspect of the present invention there is provided a communication system. A particular embodiment of the communication system comprises:

35 identifying means operable to identify an avatar that conveys to a viewer thereof information about a person; and communicating means operable to communicate the avatar to a mobile communication device.

According to a fourth aspect of the present invention there is provided a communication method. A particular embodiment of the communication method comprises the steps  
5 of:

determining an attribute of a communication device;  
identifying an avatar by using the attribute, wherein the avatar is such that it conveys to a viewer thereof information about a person; and  
10 communicating the avatar to the communication device in a virtual environment.

The particular embodiment of the communication method further comprises the step of replacing the avatar with  
15 another avatar.

In the particular embodiment of the communication method the step of identifying the avatar comprises identifying the avatar by comparing the attribute to a  
20 communication device identifier that is associated with the avatar.

The particular embodiment of the communication method further comprises the step of recording the communication  
25 device identifier.

The particular embodiment of the communication method further comprises the step of replacing the communication device identifier with another communication device  
30 identifier.

The particular embodiment of the communication method further comprises the step of selecting the avatar from a plurality of other avatars.  
35

The particular embodiment of the communication method further comprises the step of selecting the communication

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device identifier from a plurality of other communication device identifiers.

5 In the particular embodiment of the communication method the step of determining the attribute comprises determining the attribute by processing caller identification data that is associated with the communication device.

10 The particular embodiment of the communication method further comprises the step of creating a text, an audio and/or a video message that is associated with the avatar.

15 In the embodiment of the communication method the avatar and the plurality of other avatars depict an activity that involves the person.

In the particular embodiment of the communication method the first communication device is a mobile telephone and the attribute is a telephone number of the mobile telephone.

25 According to a fifth aspect of the present invention there is provided a communication method. A particular embodiment of the communication method comprises the steps of:

supporting at least one virtual environment that can be accessed by a first person; and

30 communicating an avatar in the virtual environment to the first person subsequent to the first person accessing the environment, the avatar being such that it can convey to the first person information about a second person.

The particular embodiment of the communication method further comprises the step of determining a level of authority associated with the second person, and providing the second person with access to the virtual environment if

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the level of authority is deemed appropriate.

5 The particular embodiment of the communication method comprises, the step of the first person assigning the level of authority.

10 In the particular embodiment of the communication method the step of supporting the virtual environment comprises arranging the virtual environment such that it has a desired appearance.

15 The particular embodiment of the communication method comprises the step of exchanging other information between the first person and the second person via the virtual environment.

20 In the particular embodiment of the communication method, the other information comprises multi-media content.

25 In the particular embodiment of the communication method the step of communicating the avatar to the first person comprises controlling whether the avatar conveys the information to the first person.

30 The particular embodiment of the communication method further comprises the step of allowing the first person to access the virtual environment via a communication network, and the step of communicating the avatar in the virtual environment to the first person via the communication network.

35 In the particular embodiment of the communication method the information conveyed by the avatar to the first person comprises audio and/or video information.

According to a sixth aspect of the present invention

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there is provided software comprising at least one instruction for causing a computing device to carry out at least one of the particular embodiments of the communication method.

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According to a seventh aspect of the present invention there is provided a computer readable medium comprising the software for causing the computing device to carry out the at least one of the particular embodiments of the communication method.

10

#### BRIEF DESCRIPTION OF THE DRAWINGS

Notwithstanding any other embodiments that may fall within the scope of the present invention, an embodiment of the present invention will now be described, by way of example only, with reference to the accompanying figures, in which:

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Figure 1 provides a schematic diagram of an embodiment of the present invention, which is in the form of a mobile telephone system;

20

Figure 2 provides an image of a virtual environment that is presented to a user of the system shown in figure 1;

25

Figure 3 shows a flow chart of a sequence of steps that are performed by the system illustrated in figure 1; and

30

Figure 4 shows a flow chart of another sequence of steps that are performed by the system illustrated in figure 1.

35

#### AN EMBODIMENT OF THE INVENTION

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With reference to figure 1, which is an embodiment of the present invention in the form of a mobile telephone system 1, the system 1 comprises numerous base stations 3 that are spread out over an area of land. Each base station 3 provides network service to a unique region 5 of the area. The regions 5 are also commonly referred to as cells. The region 5 associated with each base station 3 is defined by the broken lines shown in figure 1. Each base station 3 is under the control of a supervising computer system (not shown) so that the base stations 3 operate in a coordinated manner. As persons skilled in the art will readily appreciate, each base station 3 essentially comprises a computer controlled radio transmitter and radio receiver, and at least one antenna mounted atop a tower. The radio transmitter and radio receiver are connected to the antenna via coaxial cable. Whilst not illustrated in the figures, the mobile telephone system 1 can be accessed via other communication networks including the Internet using for example GPRS service in the system 1, and the traditional 'landline' telephone network (PSTN).

The mobile telephone system 1 also comprises numerous mobile telephone handsets 7. As the mobile telephone handsets move across the area they move in and out of the various regions 5. Each mobile telephone handset 7 is arranged to communicate with the base station 3 that provides network service to the region 5 in which the mobile telephone handset 7 is located. For example, if the mobile telephone handset 7a were located in region 5d then it would communicate with base station 3d. To communicate with other telecommunication devices (such as a traditional landline telephone or another mobile telephone 7), the mobile telephone handsets 7 and base stations 3 communicate with each other using mobile telephone transmission technology such as, for example, GSM or CDMA.

Each mobile telephone handset 7 comprises a



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determining means, an identifying means and a communicating means, all of which are in the form of software that is run on the hardware of a mobile telephone handset 7. In this particular embodiment of the present invention, the software is based on the Java programming language, which provides the advantage of making the software usable on different telephone handsets 7 that have dissimilar hardware. It is envisaged, however, that the software could be written in other programming languages ranging from assembly language to C++.

Essentially, the determining means enables a telephone handset 7 to determine an attribute of a telephone that is attempting to call a telephone handset 7. In the case of the present embodiment of the invention, the attribute is the telephone number of the telephone that is attempting to call the telephone handset 7. The telephone that is attempting to call the telephone handset 7 could be either a traditional landline telephone (such as that installed at a home or office) or one of the telephone handsets 7. The determining means determines the attribute (the telephone number of the calling telephone) by processing caller identification data, which is transmitted to the telephone handset 7 via a base station 3. As persons skilled in the art will readily appreciate, the caller identification data is generated by the telephone network.

It will be readily appreciated by those skilled in the art that the present invention is not restricted to determining an attribute in the form of the telephone number of the calling telephone. It is envisaged that other embodiments of the present invention may determine other forms of the attribute such as, for example, a PIN code associated with the person using the calling telephone, or an IP address of a computer attempting to contact a telephone handset 7 via a GPRS service.

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Once the determining means has determined the attribute, the identifying means uses the attribute to identify an avatar. As indicated previously, the word "avatar" as used throughout this specification is a reference to an image of some description (for example, a digital photograph or animated icon), which when viewed conveys some information about an activity that a person (that is, a user of the called mobile telephone handset 7) is engaged in. For instance, an avatar of a surfboard or book would respectively indicate that the user of the called mobile telephone handset 7 is out surfing or reading.

It is noted that the present embodiment of the invention is not restricted to use in a social context and has application to other contexts including a business context. In the business context the avatar may represent an image of, for example, a CEO in an aeroplane or in a vehicle to depict the fact that the CEO is travelling. Being able to use the embodiment of the present invention in a business context is particularly advantageous because it enables managers and staff to effectively communicate information about their status to other staff, and importantly enables the CEO (who is undoubtedly an extremely busy person) to efficiently manage contact with business colleagues

In using the attribute to identify the avatar, the identifying means basically searches through a 'library' of avatars each of which is associated with a communication device identifier, which as mentioned previously is effectively a telephone number. When searching through the library of avatars, the identifying means checks the communication device identifiers until it finds one that matches the attribute. On finding a matching communication device identifier, the identifying means identifies the

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avatar that is associated with the matching communication  
device identifier. In the present embodiment of the  
invention the library of avatars is contained in a  
permanent storage device, such as a SIM card or non-  
5 volatile RAM of a mobile telephone handset 7.

Subsequent to identifying the avatar, the  
communication means communicates (transmits) the identified  
avatar in a virtual environment to the telephone that  
10 called the mobile telephone handset 7. As discussed in more  
detail in the following paragraphs of this specification,  
the virtual environment effectively models a virtual room  
such as, for example, a boardroom or a lounge room. The  
advantage of depicting the avatar in the virtual  
15 environment is that it conveys more information than just  
the avatar. The mobile telephone handset 7 transmits the  
identified avatar in the virtual environment to the  
relevant base station 3, which in turn forwards the avatar  
in the virtual environment onto the calling telephone via  
20 the telephone network. When the telephone that called the  
mobile telephone 7 receives the avatar and the virtual  
environment sent by the communication means, the telephone  
presents the avatar in the virtual environment on a visual  
display so that the user of the telephone can view the  
25 avatar in the virtual environment and determine what the  
user of the called telephone handset 7 is doing.

Given that users of the mobile telephone handsets 7  
are likely to want to convey different information as they  
30 become involved in different activities, each mobile  
telephone handset 7 also comprises selecting means for  
enabling a user of a telephone handset 7 to select the  
avatar from a plurality of different avatars, which are  
stored in the memory of a mobile telephone handset 7. For  
35 instance, the different avatars could include a picture of  
a surfboard, a picture of a book, a picture of an office, a  
picture of an aeroplane, or motor vehicle. In this case,

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the selecting means would enable a user of a mobile  
telephone handset 7 to select the picture of the office if  
the user wanted to indicate (to parties calling the user's  
mobile telephone handset 7) that they were currently at  
5 work.

The selecting means is in the form of software that  
is based on the Java programming language so that it can be  
easily deployed on different mobile telephone handsets 7.  
10 However, it is contemplated that the software may be based  
on other programming languages (such as C++) in an  
alternative embodiment of the present invention. The  
software embodying the selecting means is capable of  
retrieving the different avatars from the memory of the  
15 mobile telephones 7 and presenting the retrieved avatars on  
the visual display of the mobile telephone handsets 7.  
Furthermore, the selecting means is such that it enables a  
user of a mobile telephone handset 7 to browse through the  
avatars and select the required avatar via the keypad of  
20 the mobile telephone handsets 7.

Each mobile telephone handset 7 also comprises  
specifying means, which is in the form of software that  
runs on the hardware of the mobile telephone handsets 7.  
25 In this regard, the software embodying the specifying means  
is based on the Java language. It is, however, envisaged  
that the software could be based on other programming  
languages (for example C++) in alternative embodiments of  
the present invention. The specifying means enables a user  
30 of a mobile telephone 7 to specify the communication device  
identifier (that is, the telephone number) that is  
associated with the avatar. As described previously, the  
identifying means uses the communication device identifier  
when attempting to identify the avatar. The selecting means  
35 is arranged such that a user of the mobile telephone  
handset 7 can specify (enter) the communication device  
identifier by using the keypad of a mobile telephone

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handset 7. Being able to specify the communication device identifier is particularly advantageous because it enables the user to effectively control which avatar is sent to a particular calling telephone.

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Each mobile telephone handset 7 also comprises an environment support means which is in the form of software running on the hardware of the telephone handsets 7. As with the other software loaded on the telephone handsets 7, 10 the software embodying the environment support means is based on the Java programming language. However, in alternative embodiments of the present invention the environment support means could be implemented in other programming languages such as C++. The software that 15 represents the environment support means is basically a graphics software package that supports virtual environments. The environment support means is operable to support one or more virtual environments that can be accessed by a user of a telephone handset 7. The 20 environment support means is arranged to support the virtual environments by allowing users of the telephones 7 to create, maintain and delete the environments as required, all of which can be performed via the user interface of a mobile telephone handset 7. It is noted 25 that the virtual environments can exist even though no users are accessing the environments.

The environment support means is such that the virtual environments represent different virtual 30 environments such as a lounge room or office that can be visited by telephone users (calling parties). An example of one possible virtual environment is shown in figure 2. When a person visits a virtual environment they are effectively accessing an environment supported by the environment 35 support means. As part of maintaining the virtual environment, the environment support means allows a user of a mobile telephone handsets 7 to arrange the virtual



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environment such that it has a desired appearance. Effectively, this means that a user of a telephone handset 7 can, for example, hang a range of virtual pictures on the walls that define the virtual environment, or arrange the virtual furniture in the virtual environment. This allows a user of a telephone handset 7 to personalise the virtual environment.

In order to gain access to a virtual environment supported by the environment support means, a calling party effectively logs onto one of the mobile telephone handsets 7 via the base stations 3. In the present embodiment of the invention the process of logging onto the telephone handset 7 is by way of username and password. Basically, this involves calling a telephone handset 7 that is maintaining (via the environment support means) the virtual environment. Assuming that the log on process is successful, the environment support means will provide the calling party that has logged onto the telephone handset 7 with a list of virtual environments that are currently active on the called mobile telephone handset 7. It is noted that each of the virtual environments can be different, and by way of example one of the virtual environments may represent a virtual boardroom, another of the virtual environments may represent a virtual reception area of an office, and yet another of the virtual environment may represent the passenger compartment of an aeroplane.

By using the user interface of a telephone handset 7, the user that has logged onto one of the telephone handsets 7 selects one or more of the currently active virtual environments. Subsequent to selecting the one or more active virtual environments, the environment support means operating on the telephone handset 7 that the user has logged onto determines whether the user has been assigned an appropriate level of authority to access the selected



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virtual environments. The environment support means is such that it provides a user with access to the selected virtual environments provided the user has the appropriate level of authority to access the virtual environments.

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The environment support means is such that it allows an administrator of the virtual environments (which is typically the person that created the environment) to set the level of authority required to access the environments, and assign a level of authority to users of the mobile telephone handsets 7. This allows the administrator to control access to the virtual environments, which can include denying certain people from gaining access to one or more of the virtual environments. This can be useful, for example, where a CEO of a business only wants to let certain people into his virtual office.

Once a person is provided with access to one or more selected virtual environments, they will be presented with one or more avatars each of which represents another user who is currently accessing the same virtual environment. The avatars are presented on the visual display of a mobile telephone handset 7. The avatars are presented in the virtual environment. The communicating means (referred to previous in this description of the embodiment of the invention) is further arranged to communicate the one or more avatars to the user. It is noted that when the user is provided with access to the one or more of the selected virtual environments the communicating means will provide the other users who are currently accessing the same environment with an avatar that represents the user that has just been provided with access to the environment. Thus, effectively making the virtual environment a substantially real-time environment that quickly conveys changes to the virtual environment.

The avatars communicated by the communicating means

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are arranged to convey information, in the form of audio information, to a user of a telephone handset 7 subsequent to being communicated to the users, which is typically via the visual display of a telephone handset 7 being used by the user. To present the audio information to the user the communicating means is arranged to interact with the audio circuit of the mobile telephone handset 7.

In addition to conveying information using the avatars, the present embodiment of the invention allows users who have been provided with access to the environments to use the environments to exchange other information, in the form of multi-media information, with each other.

15

The present embodiment of the invention also provides controlling means that is operable to allow a person that is represented by an avatar to control who can receive the information conveyed by the avatar. The controlling means is in the form of software that runs on the hardware of the telephone handsets 7. As with the other software that is loaded onto a telephone handset 7, the software embodying the controlling means is based on the Java programming language. However, it is envisaged that in other embodiments of the present invention the controlling means can be implemented in other languages such as C++. Effectively, the controlling means enables users who have been given access to the virtual environments to establish private communications with each other. If control is not exerted over who the avatar conveys the information to, the avatars will convey the information to all users that are accessing the virtual environment. Thus, the controlling means provides a mechanism for users to communicate in private.

35

Whilst the present embodiment of the invention has been described with particular application to a mobile

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telephone network, it will be readily appreciated by those skilled in the art that the present invention has application to other communication systems. For instance, the other communication systems could include a video conferencing system, an electronic messaging system (such as Internet based instant messaging), or computer communication systems. Furthermore, in alternative embodiments of the present invention the mobile telephone handsets 7 could be replaced with portable digital assistants (PDAs) that have suitable wireless interfaces that enable the PDAs to communicate via the system 1. An example of these types of PDAs are those available from BlackBerry.

Furthermore, it will be readily appreciated by those skilled in the art that even though the described embodiment of the present invention effectively indicates that the virtual environments are maintained on the mobile telephone handsets 7, an alternative embodiment of the present invention may have the virtual environments maintained on a computer system that forms part of the telephone network, in much the same way as many telecommunication networks now incorporate a voice mail service.

Those skilled in the art will appreciate that the invention described herein is susceptible to variations and modifications other than those specifically described. It should be understood that the invention includes all such variations and modifications which fall within the spirit and scope of the invention.

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CLAIMS:

1. A communication system comprising:  
determining means operable to determine an attribute  
5 of a communication device;  
identifying means operable to identify an avatar by  
using the attribute, wherein the avatar is such that it  
conveys to a viewer thereof information about a person; and  
communicating means operable to communicate the  
10 avatar to the communication device in a virtual  
environment.
2. The communication system as claimed in claim 1,  
further comprising replacing means operable to replace the  
15 avatar with another avatar.
3. The communication system as claimed in claim 2,  
wherein the identifying means is operable to identify the  
avatar by comparing the attribute to a communication device  
20 identifier that is associated with the avatar.
4. The communication system as claimed in claim 3,  
further comprising recording means arranged to allow the  
person to record the communication device identifier.  
25
5. The communication system as claimed in claim 4,  
wherein the replacing means is further operable to replace  
the communication device identifier with another  
communication device identifier.  
30
6. The communication system as claimed in claim 5,  
further comprising selecting means operable to allow the  
person to select the avatar from a plurality of other  
avatars.  
35
7. The communication system as claimed in claim 6,  
wherein the selecting means is further operable to allow

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the communication device identifier to be selected from a plurality of other communication device identifiers.

8. The communication system as claimed in claim 7,  
5 wherein the determining means is operable to determine the attribute by processing caller identification data associated with the communication device.

9. The communication system as claimed in claim 8,  
10 further comprising messaging means operable to create a text, an audio and/or a video message that is associated with the avatar.

10. The communication system as claimed in claim 9,  
15 wherein the avatar and the plurality of other avatars depict an activity that involves the person.

11. The communication system as claimed in claim 10,  
20 wherein the communication device comprises a mobile telephone and the attribute comprises a telephone number of the mobile telephone.

12. A communication system comprising:  
an environment support means operable to support at  
25 least one virtual environment that can be accessed by a first person; and

a communicating means operable to communicate an avatar in the virtual environment to the first person subsequent to the first person accessing the environment,  
30 the avatar being such that it can convey to the first person information about a second person.

13. The communication system as claimed in claim 12,  
which the environment support means is operable to  
35 determine a level of authority associated with the second person, and provide the second person with access to the virtual environment if the level of authority is deemed

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appropriate.

14. The communication system as claimed in claim 13,  
wherein the environment support means is operable to allow  
5 the first person to assign the level of authority.

15. The communication system as claimed in claim 14,  
wherein the environment support means is such that it  
allows the first person to arrange the virtual environment  
10 such that it has a desired appearance.

16. The communication system as claimed in claim 15,  
wherein the environment support means is operable to allow  
the first person and the second person to exchange other  
15 information via the virtual environment.

17. The communication system as claimed in claim 16,  
wherein the other information comprises multi-media  
content.  
20

18. The communication system as claimed in claim 17,  
wherein the communicating means is further operable to  
allow the second person to control whether the avatar  
conveys the information to the first person.  
25

19. The communication system as claimed in claim 18,  
wherein the environment support means is operable to allow  
the first person to access the virtual environment via a  
communication network, the communicating means also being  
30 operable to communicate the avatar in the virtual  
environment to the first person via the communication  
network.

20. The communication system as claimed in claim 19,  
35 wherein the information conveyed by the avatar to the first  
person comprises audio and/or video information.



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21. A communication method comprising the steps of:  
determining an attribute of a communication device;  
identifying an avatar by using the attribute, wherein  
the avatar is such that it conveys to a viewer thereof  
5 information about a person; and  
communicating the avatar to the communication device  
in a virtual environment.

22. The method as claimed in claim 21, further  
10 comprising the step of replacing the avatar with another  
avatar.

23. The method as claimed in claim 22, wherein the  
step of identifying the avatar comprises identifying the  
15 avatar by comparing the attribute to a communication device  
identifier that is associated with the avatar.

24. The method as claimed in claim 23, further  
comprising the step of recording the communication device  
20 identifier.

25. The method as claimed in claim 24, further  
comprising the step of replacing the communication device  
identifier with another communication device identifier.  
25

26. The method as claimed in claim 25, further  
comprising the step of selecting the avatar from a  
plurality of other avatars.

27. The method as claimed in claim 26, further  
comprising the step of selecting the communication device  
identifier from a plurality of other communication device  
identifiers.  
30

28. The method as claimed in claim 27, wherein the  
step of determining the attribute comprises determining the  
attribute by processing caller identification data that is  
35

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associated with the communication device.

29. The method as claimed in claim 28, further  
comprising the step of creating a text, an audio and/or a  
5 video message that is associated with the avatar.

30. The method as claimed in claim 29, wherein the  
avatar and the plurality of other avatars depict an  
activity that involves the person.

10

31. The method as claimed in claim 30, wherein the  
communication device is a mobile telephone and the  
attribute is a telephone number of the mobile telephone.

15 32. A communication method comprising the steps of:  
supporting at least one virtual environment that can  
be accessed by a first person; and  
communicating an avatar in the virtual environment to  
the first person subsequent to the first person accessing  
20 the environment, the avatar being such that it can convey  
to the first person information about a second person.

33. The method as claimed in claim 32, further  
comprising the step of determining a level of authority  
25 associated with the second person, and providing the second  
person with access to the virtual environment if the level  
of authority is deemed appropriate.

34. The method as claimed in claim 33, further  
30 comprising the step of the first person assigning the level  
of authority.

35. The method as claimed in claim 34, wherein the  
step of supporting the virtual environment comprises the  
35 step of arranging the virtual environment such that it has  
a desired appearance.

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36. The method as claimed in claim 35, further comprising the step of exchanging other information between the first person and the second person via the virtual environment.

5

37. The method as claimed in claim 36, wherein the other information comprises multi-media content.

38. The method as claimed in claim 37, wherein the step of communicating the avatar to the first person comprises the step of controlling whether the avatar conveys the information to the first person.

39. The method as claimed in claim 38, further comprising the step of allowing the first person to access the virtual environment via a communication network, and the step of communicating the avatar in the virtual environment to the first person via the communication network.

20

40. The method as claimed in claim 39, wherein the information conveyed by the avatar to the first person comprises audio and/or video information.

41. Software comprising at least one instruction for causing a computing device to carry out the method as claimed in any one of claims 21 to 40.

42. A computer readable medium comprising the software as claimed in claim 41.

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